

CLAIMS

What is claimed is:

1. A field emission tip, comprising a structure comprising at least one of semiconductive material and conductive material, said structure including a periphery with an at least substantially vertical sidewall portion and an apex at the top of said structure.
2. The field emission tip of claim 1, wherein a height of said at least substantially vertical portion exceeds a width of said structure.
3. The field emission tip of claim 1, wherein said apex comprises a low work function material.
4. The field emission tip of claim 3, wherein said low work function material is selected from the group comprising aluminum titanium silicide, titanium silicide nitride, titanium nitride, tri-chromium mono-silicon, and tantalum nitride.
5. The field emission tip of claim 1, wherein said apex has a lateral width of less than about 100 nm.
6. The field emission tip of claim 1, wherein said apex has a lateral width of less than about 50 nm.
7. A field emission tip, comprising a structure comprising at least one of semiconductive material and conductive material, said structure including a periphery with an at least substantially vertical portion and an apex at the top of said structure, said apex having a lateral width of less than about 100 nm.
8. The field emission tip of claim 7, wherein said apex has a lateral width of less than about 50 nm.

9. The field emission tip of claim 7, wherein said apex comprises a low work function material.

10. The field emission tip of claim 9, wherein said low work function material is selected from the group comprising aluminum titanium silicide, titanium silicide nitride, titanium nitride, tri-chromium mono-silicon, and tantalum nitride.

11. A field emission array, comprising:
a substrate; and
at least one substantially pointed tip protruding from said substrate, said at least one substantially pointed tip comprising at least one of a semiconductive material and a conductive material, said at least one substantially pointed tip including a periphery, at least a portion of said periphery being oriented substantially perpendicularly relative to said substrate.

12. The field emission array of claim 11, wherein at least said portion of said periphery is adjacent said substrate.

13. The field emission array of claim 11, wherein a height of at least said portion of said periphery relative to said substrate exceeds a width of said at least one substantially pointed tip.

14. The field emission array of claim 11, wherein a top portion of said at least one substantially pointed tip comprises a low work function material.

15. The field emission array of claim 14, wherein said low work function material is selected from the group comprising aluminum titanium silicide, titanium silicide nitride, titanium nitride, tri-chromium mono-silicon, and tantalum nitride.

16. The field emission array of claim 11, further comprising redeposition material adjacent at least a portion of said periphery.

17. The field emission array of claim 11, wherein an apex of said at least one substantially pointed tip has a lateral width of less than about 100 nm.

18. The field emission array of claim 11, wherein an apex of said at least one substantially pointed tip has a lateral width of less than about 50 nm.

19. A field emission display, comprising:
an anode display screen;
a cathode spaced apart from said anode display screen, said cathode including:
a substrate;
at least one substantially pointed tip protruding from said substrate, said at least one substantially pointed tip comprising at least one of a semiconductive material and a conductive material, said at least one substantially pointed tip including a periphery, at least a portion of said periphery being oriented substantially perpendicularly relative to said substrate; and
an gate through which said at least one substantially pointed tip is exposed;
a substantial vacuum between said anode display screen and said cathode; and
a voltage source associated with said anode display screen, said grid, and said cathode to provide a potential difference between said cathode and said grid and between said cathode and said display screen.

20. The field emission display of claim 19, wherein at least said portion of said periphery is adjacent said substrate.

21. The field emission display of claim 19, wherein a height of at least said portion of said periphery relative to said substrate exceeds a width of said at least one substantially pointed tip.

22. The field emission display of claim 19, wherein a top portion of said at least one substantially pointed tip comprises a low work function material.

23. The field emission display of claim 22, wherein said low work function material is selected from the group comprising aluminum titanium silicide, titanium silicide nitride, titanium nitride, tri-chromium mono-silicon, and tantalum nitride.

24. The field emission display of claim 19, further comprising redeposition material adjacent at least a portion of said periphery.

25. The field emission display of claim 19, wherein an apex of said at least one substantially pointed tip has a diameter of less than about 100 nm.

26. The field emission display of claim 19, wherein an apex of said at least one substantially pointed tip has a diameter of less than about 50 nm.